night and was growing worse. The examination revealed marked tenderness at the situation of the gallbladder, which was the only tender point present. When pressure was made over the region of the gallbladder at the end of a deep inspiration it made the patient shriek with pain and brought the tears to her eyes. The diagnosis of gallstones was made, having duodenal ulcer in mind, however. When the abdomen was opened a normal gallbladder was revealed and upon further examination it was seen that the patient was suffering from a duodenal ulcer, which was situated on the posterior surface of the duodenum. The ulcer was bound down by adhesions. There was no question but that the woman's pain was caused by duodenal ulcer. I performed a posterior gastro-enterostomy and buried the ulcer with a purse string sature and practically obliterated the pylorus. I mention this case because of the difficulties associated with the diagnosis of duodenal ulcer. There are many cases of duodenal ulcer that are overlooked because they are not accompanied by classic signs and we have much to learn as far as they are concerned. I can recall the case of a New York banker who recently died. He had consulted every medical man of importance in the East and Europe. He expired suddenly and at the autopsy it was found he had died from a hemorrhage proceeding from a duodenal ulcer.

Doctor H. A. L. Ryfkogel, discussing: I was interested in the remarks of Doctor Levison with regard to getting his patients up early after an operation. I have been for the last three years in the habit of forcing my laparotomy patients to get out of bed no later than the third day. I felt that getting them up the first day was perhaps too much, but by getting them out on the third day they have made more rapid convalescence than otherwise. Of course, I have been very particular about saturing of the wounds and also with regard to the type of dressing put upon the abdomen, particularly if the wounds are very long ones. If one puts a well patient to bed for a couple of weeks, at the end of that time the circulatory system is not in as good condition as when the patient was put to bed and certainly the same thing occurs in patients in whom we have made any kind of an operation. It is also true that the statistics have shown that thrombosis has been definitely less common in patients who have gotten up early after operations than those who have stayed in bed the classical three weeks. Another thing to be noticed in getting these patients up early is that you have very much less trouble with gaseous distension and constipation than with those patients who stay in bed longer. I have an appendix case now upon whom I operated yesterday morning who sat up in a chair this afternoon and will to-morrow walk. I instruct the nurse that the patients can do just as they wish with regard to getting up immediately. If they want to sit up, no matter what the position, I permit them to take that position and I find that the patients are much better for it.

PASSIVE MOTION.*

By S. J. HUNKIN, M. D., San Francisco.

During the last few months two patients have appeared at our office a few months subsequent to fractures around the elbow, with the elbow joint swollen, thickened, tender and practically ankylosed. The bones in each instance were in fairly good position and in my opinion the more or less ruined condition of these joints was due to the so-called "passive motion." Each year we see at least a dozen joints, especially elbows and knees, damaged to a marked degree by this crude and dangerous practice. While it may be within the skill of a Bardenhawer to play and meddle with fractures in and around joints before the healing process is about completed, and while perhaps such measures may be advantageous in such hands, yet in my opinion in the practice of the ordinary man, the procedure is dangerous and is generally productive of nothing but harm. That accidents even are not rare is evidenced by the fact that within the past two years, I have seen a severe hemorrhage into the knee, two instances of refracture at the elbow, one supracondyloid and the other at the base of the olecranon, one refracture at the wrist, and one streptococcus infection after repeated anesthetization for passive motion, with resultant destruction of the joint and grave risk of amputation; these accidents being in direct consequence of meddlesome interference with the fracture during the process of repair. Times without number during this period have we seen patients in the extreme of terror, horrified, trembling (and not all of them children) in abject fear of the doctor handling the extremity, so terrible has been their experience, and so much has the joint been hurt, damaged and abused, in misguided attempts to forcibly increase the range of motion. Ofttimes they tell of repeated anesthetizations, so that this so-called passive motion may be carried out. Again and again have I been a witness to this procedure. The patient sits or crouches before the operator, who grasps the tender, injured, rebelling limb forcibly and again flexes and extends it. The suffering structures are torn and wrenched and torn again, until outraged nature cries, and shriek after shriek peals from the patient, who grovels on the floor in entreaty and protest. Such practice measures the crazed fear, the frenzied anchylophobia of the worried doctor, and this is a protest against the need of any such treatment.

The pain provoked stands in evidence against its value. We do not believe that pain is a requisite part of the treatment of any fracture after the reposition of the separated ends. Sometimes, alas, it is a concomitant of our lack of deftness of hand, of our slowness of wit, which prevents the securing of immobilization, so promptly, so easily and so certainly as desired, but always its production is deplored and certainly never to be provoked. Let me recur to some words of John Hilton. Speaking of the early man he says: "Pain was the prime agent. Under

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injury pain suggested the necessity of and indeed compelled him to seek for rest. Every deviation from this necessary state of rest brought with it, through pain, the admonition that he was straying from the condition essential to his restoration. He must have observed with astonishment the breaking asunder of the newly formed tissue, or the steady development into normal structure, which occurred in exact accordance with the disturbance or rest to the parts which the sense of pain had enabled him to regulate so accurately. . . . Growth and repair bear an exact relation to due physiological rest, local and general."

Gentlemen, I need not call your attention to the difficulty in getting satisfactory repair in tissues where rest cannot readily be secured. Take an anal fissure, for instance, where the healing structures are ever and anon violently separated from the needed rest, how the tortured nerves cry for rest and immobility. You can also readily see what happens in the joint undergoing repair, when the tissues are put upon tension and bruised and torn and bleed again. It needs also but a cursory study to see Nature's attempt to give rest, the organization of the effused blood, the production of more and more callus, the building up, around, and within of more material, the pouring out of more lymph and the development of more and more natural splinting, perhaps a resultant ankylosis and the production of what was the chief object of the surgeon to prevent. It may be accepted as axiomatic that the closer the approximation of the fractured bones, and the more secure this position is maintained, and the less meddling attempted, the less callus is produced and it follows as the sunshine follows the rain, the better the repair and the quicker and surer the return of function. On the other hand, the greater the displacement and the more joggle permitted, the more callus and generally the lesser function. I take it, it is a truism in surgery, the more perfect the physiological rest secured during the entire process of repair, the more perfect the healing and the more likely the easy, rapid and natural resumption of function.

What is "active motion" and what is meant by "passive motion?" Active motion, we understand, is that movement made in a joint by the contraction of the muscles around the joint, or more correctly, if more narrow, perhaps, the movement produced in a joint by muscular action in even balance, of the subject. On the other hand passive motion designates the movement produced by outside forces (usually the hand of the operator) in the joint of the subject, while his muscular system is in complete relaxation. This absolute or even approximate relaxation presumes freedom from pain and this in its turn presupposes practically no mechanical barrier to movement. It is hardly conceivable that such relaxation can be obtained in a conscious patient, during any amount of movement, if adhesions exist, or any mechanical barrier is present in a joint. If such are not present, then no reason exists for the practice. Under complete anesthesia then only can passive movement be made against mechanical impediment and then it seems to me, it must only add new traumatism to the old, provoke new production of callus and in the large majority of cases, new adhesions must form and only harm result, unless anesthesia is maintained and movements kept up, during the whole process of repair, if repair would go on under such circumstances. If mechanical conditions are such in a recovering joint that forcible corrections under anesthesia appear advisable, surely it is better surgery to open the joint and either alter the condition or remove the barrier.

Discussion.

Dr. T. W. Huntington, San Francisco: This is a very opportune time in which to say a word in connection with a subject which has often been in my mind. The Society is to be congratulated upon having listened to so rational an expression relative to a subject to which too little attention has been paid in the past. There is one side of surgery which has appealed to me perhaps more than any other. This is not altogether scentific, but it makes for what I regard as humane. The impropriety of the unnecessary production of pain cannot be too clearly set forth. As a rule, it is not necessary to do such violence in the handling of joint injuries as to produce great pain. Finesse, gentle handling, and extreme delicacy of touch are essential qualities of the surgeon. I have learned to deplore the scream of the child or the groan of the adult, and I hope never to be disabused of this idea.

Dr. S. Stillman, San Francisco: While I think we all agree with the proposition that the old method of forcible breaking up adhesions, and passive motion in the sense of "brisement forcee" is wrong and has been abandoned by the profession, there is still, however, need of passive motion in the proper sense. Colles' and other fractures at or near joints and in people who will not move their fingers or wrists or other joints, are cases requiring judicious passive motion. Abel Mix Phelps of New York laid down the law ten years ago that passive motion should never be given under anesthetic because one could not tell the damage one was doing the joint, that consciousness to pain must be present and that pain must be produced in moderation, but should not go to the extent of actual suffering, that passive motion was necessary but should never be undertaken under anesthetic or never to the point of occasioning real suffering. That has been my guidance. I do not think I have ever hurt anybody or injured anyone, but I have had, even with such modified and such careful passive motion, a good deal of difficulty in getting old women with Colles' fractures to use any effort of their own to improve the function of their joints and I believe both passive motion and massage are of great importance in the treatment of these cases, as much as in fractures involving other joints.

Dr. L. J. Belknap, San Jose: I have had a good deal to do with joints, especially ankylosed joints, and also joints after operations and have obtained the best results from a treatment similar to the Bier treatment, but using the hot and cold air treatment. After fractures we massage the thigh above and take the large toe as an index, watching the color change. We also use the deep breathing exercises to improve the circulation. We recently had a case sent in from the lumber camps, where a large log had rolled on the patient breaking the tibia and fracturing the fibula. When he came to us it was terribly swollen and after packing with ice, examination with the X-ray showed the fracture. After putting the leg in place, we treated with massage with excellent result. With the hot and cold air treatment the tem-

perature carried to about 250 degrees and we used the cold to stimulate the deeper tissues. In these fracture cases we also use heat and cold to the spine, beginning with friction.

THE INTERRELATIONS OF GLANDS WITH INTERNAL SECRETION.

Since Brown-Sequard guided by the fatal results of the extirpation of the suprarenal glands first established the idea of internal secretion, the physiological and clinical significance of the function of the ductless glands has been the subject of great controversy. On the one side it was looked upon as a fantastic creation of the imaginative mind of the great French physiologist, on the other hand general conclusions without experimental or clinical foundation were drawn. The whole theory of internal secretion was placed upon solid ground by clinical experience; the occurrence of myxedema after the complete extirpation of the thyroid. The chain of evidence was closed when the cure of myxedema was obtained by the feeding of thyroid extract or gland.

This was soon followed by the work of Mering and Minkowsky demonstrating the diabetes following the extirpation of the pancreas. The theory of Mobius relating the symptomcomplex of exophthalmic goitre to the hyper-secretion of the thyroid gland found enthusiastic reception after the thorough establishment of the theory of internal secretion. The recent researches showing the relations of tetany to the parathyroid glands, of acromegaly to changes in the hypophysis, completed the list of new facts gained in the domain of internal secretion.

Clinical and experimental data pointed to the fact that the product of these internal secretions regulated certain very definite functions of the animal economy easily demonstrable by experimentation.

The first fact establishing the relation of two glands to each other is due to the experimental genius of Bayliss and Starling.[1] Pawlow had established the fact that the contact of the acid stomach contents with the mucosa of the duodenum produced a secretion of the pancreas. The mechanism of this action became clear when Bayliss and Starling demonstrated that an acid extract of the mucosa injected into the blood started the secretion of the pancreas. They established at the same time the fact that the subsance formed in the mucosa withstands boiling and therefore does not belong to the category of ferments; its was classed as a hormon and named secretine.

A second hormon was found by the same two physiologists in the ovaries of pregnant animals. They obtained a substance, withstanding heating, which, when injected into non-pregnant animals, caused enlargement of the breasts and lactation.

Of the greatest interest are the recent discoveries of Leo Loeb.[2] He extracted from the corpus luteum of pregnant animals a substance, which when injected into a normal animal caused the formation of a decidua.

Very nearly related to the hormons is the product of the internal secretion of the chromaffine system; adrenalin. A number of cells are found throughout the body, principally in the medullary portion of the suprarenal glands, partly scattered throughout the sympathetic nervous system, characterized by their affinity for the chromic salts. The chromaffin substance these cells contain is adrenalin. Like the hormons, it withstands heating; its constitution is so simple that its chemical synthesis has already been achieved.

Adrenalin besides regulating the tonus of the peripheral vessels has a very important function in the metabolism. Blum [3] first discovered that the injection of adrenalin produced constantly a glycosuria. Under the influence of muscular work the cells of the cromaffin system lost their affinity for chronic salts showing that their adrenalin has been used up. As at the same time the glycogen disappears, Schur and Wiesel [4] suggest that this process of melting down of glycogen is due to the action of adrenalin and that in general the mobilization of the carbohydrates in the animal body is regulated by adrenalin. It is highly probable that the glycosuria after the intravenous injection of adrenalin depends upon a too rapid and excessive mobilization of carbohydrates.

On the other hand the pancreas secretes a substance which oxydizes sugar into CO^2 and H_2O. The absence of the internal pancreatic secretion causes a hyperglycemia, as the tissues have lost the ability to oxydize sugar. Under normal conditions the mobilization of carbohydrates by adrenalin and the oxydation by the pancreatic secretion go hand in hand and the percentage of sugar in the tissues and in the blood is kept at a constant level. If this equilibrium is disturbed through increased mobilization by adrenalin or diminished destruction by the pancreas hyperglycemia results with excretion of glucose in the urine.

The carbohydrate metabolism is, however, not only regulated by these two internal secretions; an important part is played by the thyroid gland, which exerts an inhibitory action upon the pancreas. Hyperfunction and hypersecretion of the thyroid gland as observed in exophthalmic goitre results in a diminished activity of the pancreas. It has long been known that small amounts of glucose fed to patients with exophthalmic goitre produce alimentary glycosuria; the complication of Graves' disease with diabetes is by no means a clinical rarity. These clinical facts are easily explained by the inhibition of pancreatic activity by the hypersecreting thyroid.

On the other hand, enormous quantities of glucose are oxydized in myxedematous patients as the action of the pancreas is increased. Larger quantities of its internal secretion are in circulation, so that even a surplus of mobilized sugar can be taken care of. Experimentally the injection of adrenalin does not produce any glucosuria in thyroidectomised